Indiana Career Council IWIS Taskforce

Report and Recommendations to Career Council

November 25, 2013

Value Proposition of Longitudinal Data Systems

Making the best decisions for Indiana's education and workforce systems requires having easy access to relevant, accurate, and high-quality data. In order to provide Indiana stakeholders with crucial data to inform policy and decision making, Indiana has worked collaboratively across various agencies to develop a statewide longitudinal data system, named the Indiana Workforce Intelligence System (IWIS).

IWIS links various items of individual record-level data across partner agencies' data systems to create a unified data system. The system creates the ability to identify pathways from K-12 education to higher education and the workforce, allowing for powerful research and analysis capabilities. The system allows stakeholders, such as education professionals, employers, policymakers, students, community leaders, and the public to answer key questions about the education to workforce pipeline and provides critical information to enhance Indiana's education, job skills development, and career training system, as well as to inform Indiana's economic development.

Overview of IWIS

Established in 2007, the Indiana Workforce/Education Intelligence System (IWIS) is the result of a partnership among the Indiana Department of Workforce Development (DWD), the Indiana Commission on Higher Education (CHE), the Indiana Department of Education (IDOE) and the Indiana Business Research Center (IBRC, a unit of Indiana University). The partnership has been formalized by a Memorandum of Understanding among the partners that includes agreements in how the governance of the system is to be managed and what data is to be shared in the system.

Currently, data within IWIS spans more than 10 years of linked workforce and higher-education records and five years of K-12 records. A chart indicating the record-level data contained within the system may be found below.

Record-Level Data in IWIS
Indiana Department of Workforce Development
UI claims, benefits & demographics; wage records, CTE, EQUI, ABE, Job Match, TAA & Wagner-Peyser program data, WIA participants
Indiana Commission for Higher Education
Student records that include enrollment, graduation, degree level, academic program (CIP), remediation, GPA, transfer status, FAFSA, and other indicators
Indiana Department of Education
K-12 student records with GPA, attendance, state test scores, etc.
Indiana Business Research Center
Public employee compensation and job titles (half-million records); property parcel records; Census data

The IWIS data warehouse (built on SQL Server 2012 Enterprise) is a multifunctional set of logical databases containing a repository for dataset collection, relational scrubbed and de-duped normalized (staging areas, a report table area and an online analytical processing multi-dimensional cube structure for ad hoc querying. It operates in both development/staging (one server) and production modes (a separate server). Both servers are limited to authorized users at each partner agency who have signed agent agreements regarding data confidentiality and privacy, with no more than six authorized users at this time. A separate IWIS warehouse at Indiana University contains only non-identifiable records and is used for public-facing reports to the IWIS website and for research. Security standards of the Indiana Office of Technology and Indiana University, and federal (FERPA, CIPSEA, etc.) and state laws, govern IWIS security. The MS-SQL Server 2010 and 2012 Enterprise edition provide comprehensive Transparent Data Encryption.

Since its inception, the linked data provided within IWIS has been used by various partners and stakeholders to conduct research and develop reports regarding Indiana's K-12, post-secondary education, and workforce development systems. Some examples of annual reports that are developed through the usage of IWIS include the Commission for Higher Education's Return on Investment-College report, College Readiness report, and Public Educational Institution Reports. In addition, a number of other articles and reports have been developed through the usage of IWIS. Some of those reports may be found on the website for IWIS, located at www.iwis.in.gov .

In 2013, IWIS was statutorily-created with the passage of HEA 1002, and its oversight was assigned to the Indiana Career Council. Indiana Code 22-4.5-10, the law resulting from HEA 1002 formally required the Department of Workforce Development, the Commission for Higher Education, and the Department of Education to submit data related to educational and workforce outcomes to IWIS on a regular basis. The statute also established guidance on how the security and privacy of the data should be managed, and charged the Career Council with specific duties regarding the oversight of IWIS.

More information on the functionality may be found in the attached presentation, entitled "Presentation to the IWIS Task Force," that was provided by Scott Sanders, Commissioner of DWD, to the taskforce at its September 5, 2013 meeting.

Overview of Taskforce Meetings

The IWIS taskforce was established by the Career Council at its August 19, 2013 meeting. The Career Council charged the taskforce with reviewing the current functionality of IWIS, to investigate best practices for longitudinal data systems, and develop and submit recommendations to the Career Council for improvements to IWIS. The taskforce formed quickly, holding its first meeting on September 6, 2013. The taskforce members consisted of Representative Steve Braun, who serves as the chairman of the taskforce; Molly Chamberlin, Associate Commissioner for Research and Information, Commission for Higher Education; Derek Redelman, Vice President for Education and Workforce Policy, Indiana Chamber of Commerce; Carol Rogers, Chief Information Officer, Indiana Business Research Center ; Scott Sanders, Commissioner of the Department of Workforce Development ; and Joshua Towns, Director of Information Technology, Department of Education.

In order to fulfill its duties, the taskforce established a work plan, wherein it would first review the current functionality of IWIS, and subsequently investigate best practices throughout the U.S. by calling in experts from other states, organizations, and private groups that manage, oversee, review, and/or develop longitudinal data systems.

Throughout its review of best practices and recommendations from other states, the taskforce met with staff from Deloitte Consulting, the Data Quality Campaign, and the State of Maryland's Longitudinal Data System. The following provides a brief summary of the information shared by these groups:

Deloitte Consulting

- Challenges identified by Deloitte in the development and maintenance of state longitudinal data systems included:
    - Ensuring that technology infrastructure is scalable to support data growth;
    - Ensuring that the system protects and secures confidential and/or sensitive data; and
    - Establishing a governance structure for the system that facilitates decision-making, collaboration and coordination across multiple stakeholders, and supports the definition, security, availability, usability, and quality of data.
- Key steps that they recommended to the taskforce included:
    - Identifying the key policy questions that IWIS should be able to address;
    - Obtaining and maintaining executive buy-in and alignment;
    - Identifying a consistent stream of funding;
    - Developing and institutionalizing process that support program success; and
    - Socializing the value of IWIS.

- Deloitte recommended that the Council seek a vendor to further develop the system. They shared that such a vendor should exhibit:
    - Deep knowledge of government education and workforce programs and data, corporate workforce planning and economic competitiveness;
    - Extensive analytics capabilities and experience, including predictive analytics;
    - Successful large scale systems implementation experience; and
    - Data privacy and protection experience.

A copy of the presentation provided by Deloitte Consulting may be founded appended to this report.

Data Quality Campaign

- Through its work, the Data Quality Campaign has identified (and measures states by) ten actions for changing the culture regarding the collection and usage of data:
    - Linkage between P-20/Workforce data systems;
    - Creation of stable, sustained support;
    - Development of governance structure;
    - Building of data repositories;
    - Provision of timely access to data;
    - Creation of individual student progress reports;
    - Creation of longitudinal reports;
    - Development of a research agenda;
    - Building of educator capacity to utilize data; and
    - Raising the awareness of available data.
- Based upon their review of Indiana's practices, in 2012, the Data Quality Campaign recognized Indiana (and IWIS) for having achieved 8 of these 10 steps;
    - The Data Quality Campaign believes that Indiana is a state leader for longitudinal data systems, due in part to the inclusion of higher education and workforce development from the onset of IWIS.
- The Data Quality Campaign made the following recommendations to the taskforce:
    - Development of longitudinal data systems should begin with identifying the key questions the system should be able to address, and ensuring that the questions are aligned with the state's policy objectives;
    - It is of key importance to establish the right governance structure for the system, including the right people with the authority to make necessary decisions and implement charges, and that will ensure that the structure is sustainable;
    - State should balance the access to information with the need to ensure privacy of data; and
    - Investigate some examples of best practices from Maryland, Kentucky, and Washington.

A copy of the presentation provided by the Data Quality Campaign may be found appended to this report.

State of Maryland Longitudinal Data System

- Maryland's system began as a P-20 initiative, with the focus on linking K-12 data with post-secondary data from the University of Maryland system;
- The State of Maryland has imbedded the governance of its longitudinal data system in state law; the benefits of doing so, included:
    - Creating commitment by necessary partners that will be long-lasting and not be dependent solely upon the leadership of each partner agency or organization;
    - Formally establishing the responsibilities of each partner to the system, providing focus on security and confidentiality of data, and ensuring that all partners were represented at the table and provided with equal access to the data; and
    - Providing financial support to the operation of its system.
- Maryland's governance structure for its system includes an executive committee that is charged, by law with overseeing the development and operation of its system, including the employment of an executive director and staff to conduct the day-to-day activities of its system.
- Maryland's system is not currently developed to provide advanced analytics on the state's future workforce needs – it has been developed to provide reports and studies into the success of Maryland's P-20-workforce system.
- Staff from the State of Maryland believes that the inclusion of workforce data from the beginning of IWIS's development has positioned Indiana to be a leader in longitudinal data systems.

Following the meetings that focused on these discussions, the taskforce considered the overall objectives of IWIS, and developed the recommendations to the Career Council found within this report.

Objective of System

The comprehensive objective of IWIS is to ensure that educational data at all levels is effectively linked with workforce data in order to ensure that:

1) Education and training programs provided through the use of public resources are effectively linked to the knowledge and skills currently needed in the employment community;

2) Policy-makers, educators, and other interested groups can develop solutions that link education and training programs with the current and future skills and knowledge demands of the workforce community; and

3) Constituents have an easily-accessible system that provides reliable, linked, longitudinal education and workforce data, and aids in their decision-making, research, or analytical needs.

Recommendations

The following recommendations are based upon the practices and opportunities reviewed by the taskforce. For both of the recommendations, the taskforce has identified current issues that lead to recommendation, as well as potential solutions that have been considered.

1. Formalize Longitudinal Governance Structure

Issues

- Current law assigns governance/oversight to the Career Council:
    - Council has many other responsibilities;
    - Council not inclusive of all partners needed to close data gaps, provide data expertise and analysis;
    - Managing a critical data asset like IWIS requires a governing body chartered and organized for that specific purpose.
- In its current structure, IWIS has significant gaps in data, which affects the validity of reports and analysis provided through its use; data gaps that exist include:
    - Lack of comprehensive private post-secondary data;
        - System only includes data from public post-secondary institutions;
    - Lack of comprehensive workforce/employment data;
        - System only uses Indiana Unemployment Wage Records for employment and wage data match – does not include self-employment data; and
    - Lack of job training program data outside the scope of DWD, CHE, and DOE (only partners required to submit data into the system).
- Current law does not provide specificity on the primary policy questions the system should be designed to address:
    - Formalized Governance structure can be tasked with developing those policy questions that the system is designed to address accurately and consistently.

Solutions

- Establish formalized multi-agency governance structure that is inclusive of all partners that are "required" to submit data into the system; purposes of this governance structure would be to ensure:
    - Equal representation of partners in the governance, development, and enhancement of system;
    - Partners are guaranteed continued "ownership" of agency-specific data;
    - Equal access to the shared data maintained within IWIS is provided to partners in the system;
    - Partners are held accountable for the submission of data into the system;
    - Maximum security and confidentiality of data, adhering to federal and state standards, is maintained; and
    - Ongoing evaluation to ensure stakeholder satisfaction and usability of system.

- The governance structure should consist, at minimum, of an Executive Governance Committee and a Project Director.
    - The Executive Governance Committee would consist of executive-level leaders from the agencies that contribute data to the system, as well as additional stakeholder representatives, which may include representation from the K-12, higher education, workforce, and researcher communities.
    - The Executive Governance Committee would select a Chair from among its members to call, and preside over, meetings of the committee.
    - The Project Director would, among other duties:
        - Facilitate the work of the Executive Governance Committee, ensuring maximum engagement, input, and capacity-building among partners;
        - Manage the day-to-day activities of IWIS, working in collaboration with partner staff;
        - Work with partner staff and vendors to develop system enhancements, and to build the capacity of stakeholders to utilize linked data outputs from the system.
- Collectively, the Executive Governance Committee and the Project Director would further develop and define the responsibilities of partners included in the IWIS governance structure.

Recommendation

The Career Council should support the establishment, and formalization, of a long-term solution for the governance of the Indiana Workforce Intelligence System. This governance structure should ensure that partners that provide data into the system have equal representation and input into the oversight of the system and that those partners are guaranteed continued "ownership" of their agency-specific data.

2. Procure Vendor to Develop and Execute a Process for System Enhancements

Issues

- Current public-facing portal to system (website) is limited
    - Does not contain standard reports
    - Does not contain availability for users to "explore" the numbers
    - Does not contain a clear process for requesting ad hoc reports or analysis of data
- Policy-makers, researchers, educators, and general public do not regularly use IWIS in its current format
- As additional partners and data are added into IWIS, a long-term solution must be developed and implemented for efficiently and accurately linking all data
- Currently, there is no plan in place for the systemic provision or usage of advanced analytics within the system
- In its current functionality, IWIS is limited in its ability to project gaps between future needs of Indiana's primary employment sectors and the talents and skills of Indiana's emerging workforce

Solutions

- The Career Council, or its designee, should create and release a request for proposals to identify vendors/solutions to do the following:
    - Conduct a business process analysis for IWIS, reviewing data within system and system outputs, identifying gaps, and developing solutions;
    - Ensure that a long-term solution is in place for efficiently and accurately linking disparate data:
        - Identify potential matching solutions and select an option;
        - Review accuracy of solution and conduct test cases;
        - Ensure performance in linking tens of millions of records; and
        - Ensure ability to perpetuate linkages over time.
    - Ensure that robust, clear, transparent, and usable data structures are created:
        - Create key questions, following guidance from Career Council, or designee; rank by importance;
        - Identify the necessary data elements and identify data gaps;
        - Identify strategies for obtaining missing data elements; determine risks vs. benefits of missing data elements; and develop a process for collecting data elements, collection owners, etc;
        - Create business rules or data models; and
        - Implement data models/cubes.
    - Ensure that stakeholders have appropriate access to data and that confidentiality and security is protected:
        - Identify key audiences for each output;
        - Define output requirements, ensuring that all key questions can be answered;
        - Define output platforms and reporting mechanisms;
        - Define appropriate access and access points;
        - Create and deploy output platforms; and
        - Determine the feasibility of integrating advanced analytics into output platforms.

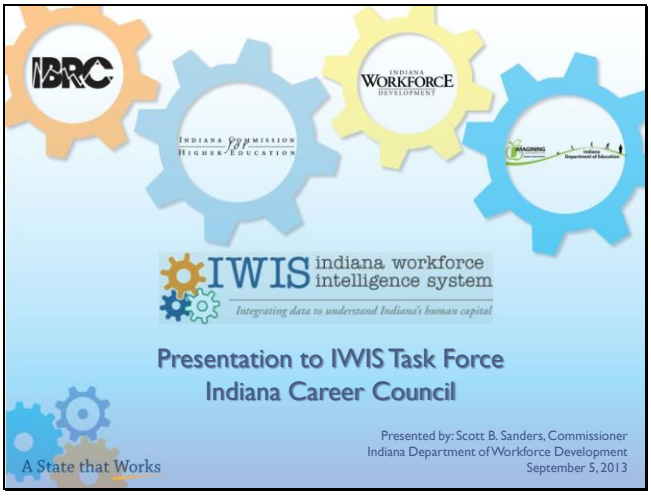
Recommendation

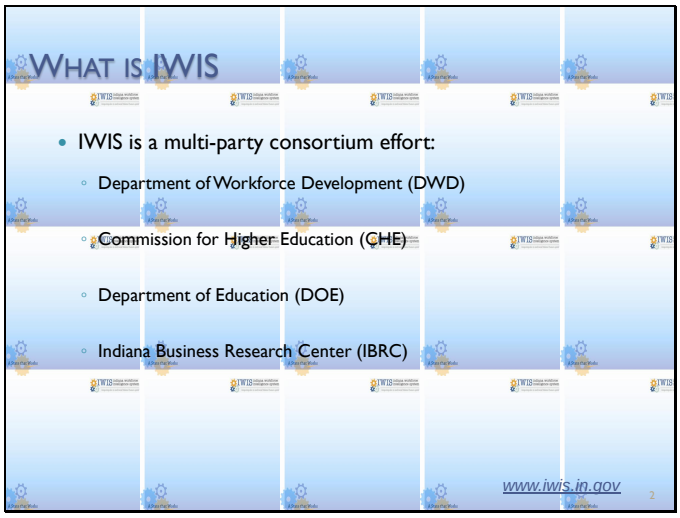
The Career Council should authorize the IWIS taskforce to manage the procurement and development process, outlined above, until such time as a new governance structure is implemented. At which time, the taskforce will cede duties and authorities to the newly-created governance entity. The taskforce shall provide regular updates to the Career Council at each of its meetings.

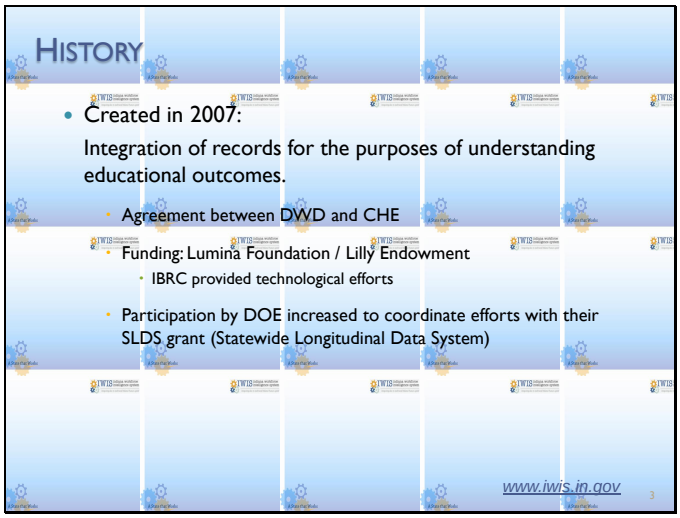
Attachments

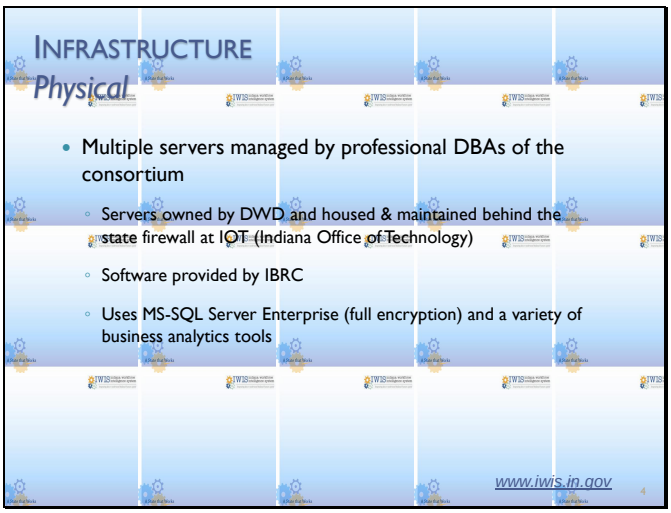
Presentation to IWIS Task Force – Scott Sanders, Commissioner, DWD
Path Forward for IWIS –Deloitte
Data Quality Campaign Presentation

Attachment 1 – Presentation to IWIS Task Force








INFRASTRUCTURE
Physical
• Multiple servers managed by professional DBAs of the consortium
◦ Servers owned by DWD and housed & maintained behind the state firewall at IOT (Indiana Office of Technology)
◦ Software provided by IBRC
◦ Uses MS-SQL Server Enterprise (full encryption) and a variety of business analytics tools
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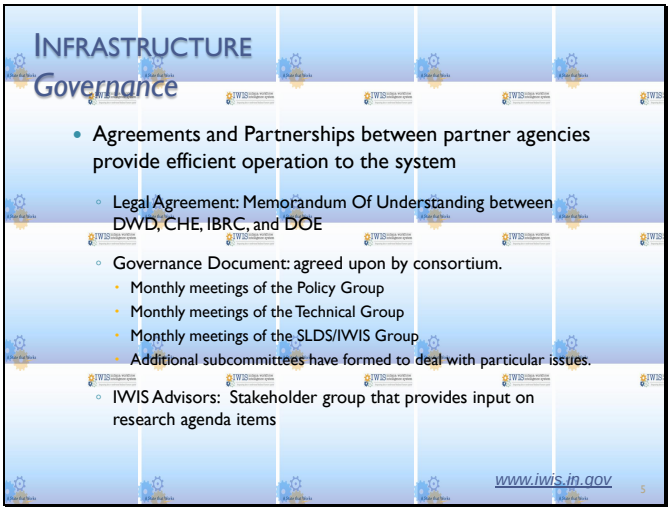
INFRASTRUCTURE
Governance
• Agreements and Partnerships between partner agencies provide efficient operation to the system
◦ Legal Agreement: Memorandum Of Understanding between DWD, CHE, IBRC, and DOE
◦ Governance Document: agreed upon by consortium.
▪ Monthly meetings of the Policy Group
▪ Monthly meetings of the Technical Group
▪ Monthly meetings of the SLDS/IWIS Group
▪ Additional subcommittees have formed to deal with particular issues.
◦ IWIS Advisors: Stakeholder group that provides input on research agenda items
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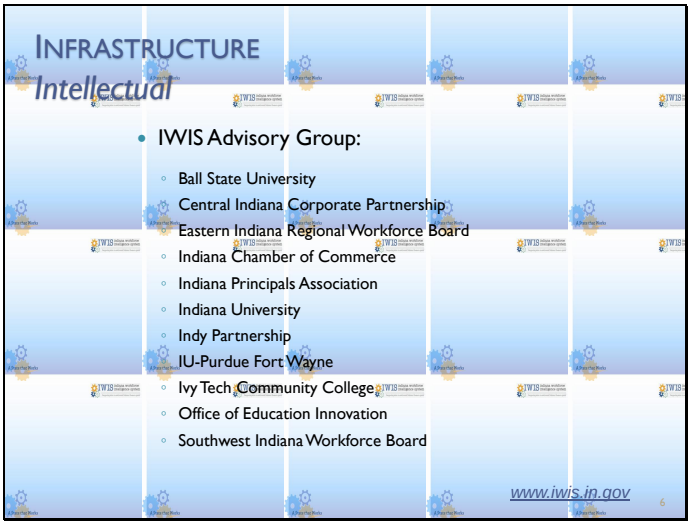
INFRASTRUCTURE
Intellectual
• IWIS Advisory Group:
◦ Ball State University
◦ Central Indiana Corporate Partnership
◦ Eastern Indiana Regional Workforce Board
◦ Indiana Chamber of Commerce
◦ Indiana Principals Association
◦ Indiana University
◦ Indy Partnership
◦ IU-Purdue Fort Wayne
◦ Ivy Tech Community College
◦ Office of Education Innovation
◦ Southwest Indiana Workforce Board
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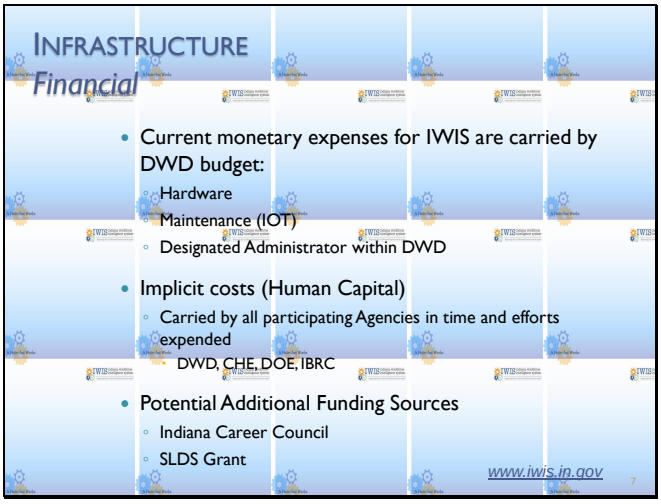
INFRASTRUCTURE
Financial
Current monetary expenses for IWIS are carried by DWD budget:
Hardware
Maintenance (IOT)
Designated Administrator within DWD
Implicit costs (Human Capital)
Carried by all participating Agencies in time and efforts expended
DWD, CHE, DOE, IBRC
Potential Additional Funding Sources
Indiana Career Council
SLDS Grant
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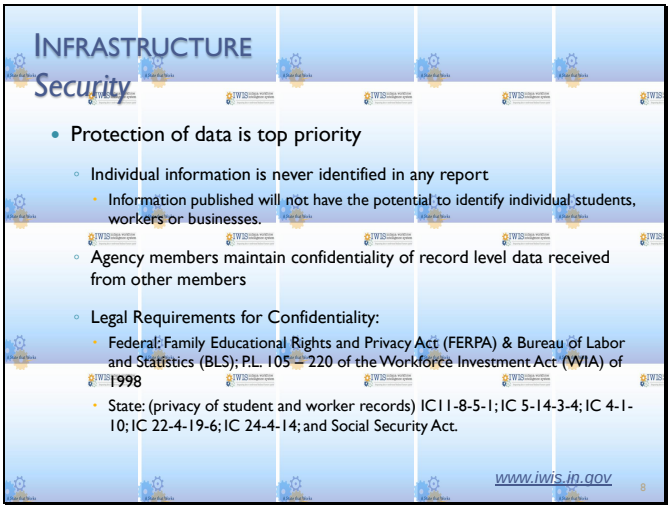
INFRASTRUCTURE
Security
Protection of data is top priority
Individual information is never identified in any report
Information published will not have the potential to identify individual students, workers or businesses.
Agency members maintain confidentiality of record level data received from other members
Legal Requirements for Confidentiality:
Federal: Family Educational Rights and Privacy Act (FERPA) & Bureau of Labor and Statistics (BLS); P.L. 105 – 220 of the Workforce Investment Act (WIA) of 1998
State: (privacy of student and worker records) IC11-8-5-1; IC 5-14-3-4; IC 4-1-10; IC 22-4-19-6; IC 24-4-14; and Social Security Act.
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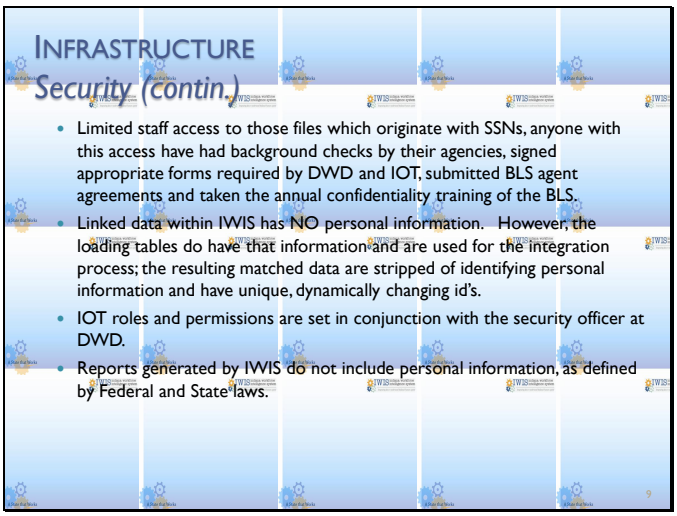
INFRASTRUCTURE
Security (contin.)
Limited staff access to those files which originate with SSNs, anyone with this access have had background checks by their agencies, signed appropriate forms required by DWD and IOT, submitted BLS agent agreements and taken the annual confidentiality training of the BLS.
Linked data within IWIS has NO personal information. However, the loading tables do have that information and are used for the integration process; the resulting matched data are stripped of identifying personal information and have unique, dynamically changing id's.
IOT roles and permissions are set in conjunction with the security officer at DWD.
Reports generated by IWIS do not include personal information, as defined by Federal and State laws.
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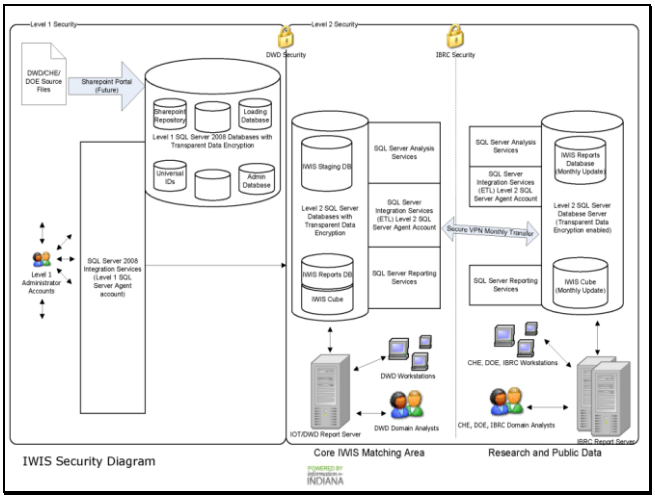
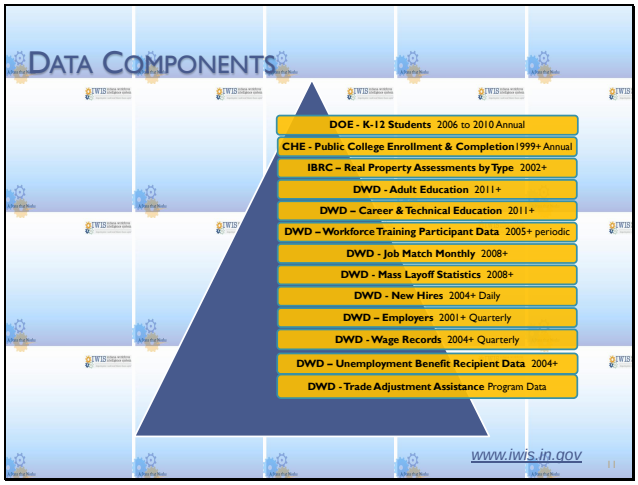

Level 1 Security
Level 2 Security
DWD Security
IBRC Security
DWD/CHE/ DOE Source Files
Sharepoint Portal (Future)
Sharepoint Repository
Loading Database
Level 1 SQL Server 2008 Databases with Transparent Data Encryption
Universal IDs
Admin Database
Level 1 Administrator Accounts
SQL Server 2008 Integration Services (Level 1 SQL Server Agent account)
IWIS Staging DB
SQL Server Analysis Services
Level 2 SQL Server Databases with Transparent Data Encryption
SQL Server Integration Services (ETL) Level 2 SQL Server Agent Account
IWIS Reports DB
IWIS Cube
SQL Server Reporting Services
SQL Server Analysis Services
IWIS Reports Database (Monthly Update)
SQL Server Integration Services (ETL) Level 2 SQL Server Agent Account
Level 2 SQL Server Database Server (Transparent Data Encryption enabled)
Secure VPN Monthly Transfer
SQL Server Reporting Services
IWIS Cube (Monthly Update)
DWD Workstations
DWD Domain Analysts
IOT/DWD Report Server
CHE, DOE, IBRC Workstations
CHE, DOE, IBRC Domain Analysts
IBRC Report Server
IWIS Security Diagram
Core IWIS Matching Area
Research and Public Data
INDIANA


DATA COMPONENTS
DOE - K-12 Students 2006 to 2010 Annual
CHE - Public College Enrollment & Completion 1999+ Annual
IBRC – Real Property Assessments by Type 2002+
DWD - Adult Education 2011+
DWD – Career & Technical Education 2011+
DWD – Workforce Training Participant Data 2005+ periodic
DWD - Job Match Monthly 2008+
DWD - Mass Layoff Statistics 2008+
DWD - New Hires 2004+ Daily
DWD – Employers 2001+ Quarterly
DWD - Wage Records 2004+ Quarterly
DWD – Unemployment Benefit Recipient Data 2004+
DWD - Trade Adjustment Assistance Program Data
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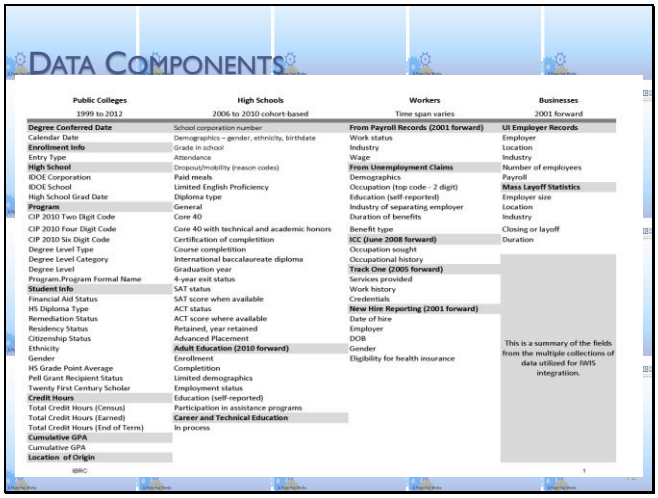
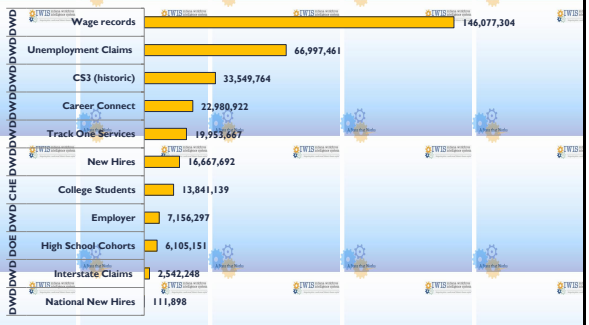

DATA COMPONENTS
Public Colleges
1999 to 2012
Degree Conferred Date
Calendar Date
Enrollment Info
Entry Type
High School
IDOE Corporation
IDOE School
High School Grad Date
Program
CIP 2010 Two Digit Code
CIP 2010 Four Digit Code
CIP 2010 Six Digit Code
Degree Level Type
Degree Level Category
Degree Level
Program.Program Formal Name
Student Info
Financial Aid Status
HS Diploma Type
Remediation Status
Residency Status
Citizenship Status
Ethnicity
Gender
HS Grade Point Average
Pell Grant Recipient Status
Twenty First Century Scholar
Credit Hours
Total Credit Hours (Census)
Total Credit Hours (Earned)
Total Credit Hours (End of Term)
Cumulative GPA
Cumulative GPA
Location of Origin
High Schools
2006 to 2010 cohort-based
School corporation number
Demographics – gender, ethnicity, birthdate
Grade in school
Attendance
Dropout/mobility (reason codes)
Paid meals
Limited English Proficiency
Diploma type
General
Core 40
Core 40 with technical and academic honors
Certification of completition
Course completition
International baccalaureate diploma
Graduation year
4-year exit status
SAT status
SAT score when available
ACT status
ACT score where available
Retained, year retained
Advanced Placement
Adult Education (2010 forward)
Enrollment
Completition
Limited demographics
Employment status
Education (self-reported)
Participation in assistance programs
Career and Technical Education
In process
Workers
Time span varies
From Payroll Records (2001 forward)
Work status
Industry
Wage
From Unemployment Claims
Demographics
Occupation (top code - 2 digit)
Education (self-reported)
Industry of separating employer
Duration of benefits
Benefit type
ICC (June 2008 forward)
Occupation sought
Occupational history
Track One (2005 forward)
Services provided
Work history
Credentials
New Hire Reporting (2001 forward)
Date of hire
Employer
DOB
Gender
Eligibility for health insurance
Businesses
2001 forward
UI Employer Records
Employer
Location
Industry
Number of employees
Payroll
Mass Layoff Statistics
Employer size
Location
Industry
Closing or layoff
Duration
This is a summary of the fields from the multiple collections of data utilized for IWIS integration.
IBRC

Data Components



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The 4 P's

- **Pathways**
  - The movement of individual students between K-12 / Higher Education / Workforce
- **Progress**
  - The benchmarks or transition points students meet – or fail to meet
- **Predictors**
  - The characteristics, patterns, or commonalities that help explain which students achieve successful outcomes and which do not.
- **Performance**
  - Education and workforce aligned for individual success

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Examples o Published Data Analysis

- Annual
  - College Readiness Reports (CHE)
  - Public Educational Institution Reports (CHE)
- Numerous Articles and Reports
  - Major Unemployment (Aug 2012)
  - How Education pays in Indiana (Nov 2011)
  - The Importance of Being Educated (Oct 2011)
  - The Unemployment Experience in Howard County, Indiana (2009)
- Support for Research Studies by Numerous Indiana organizations

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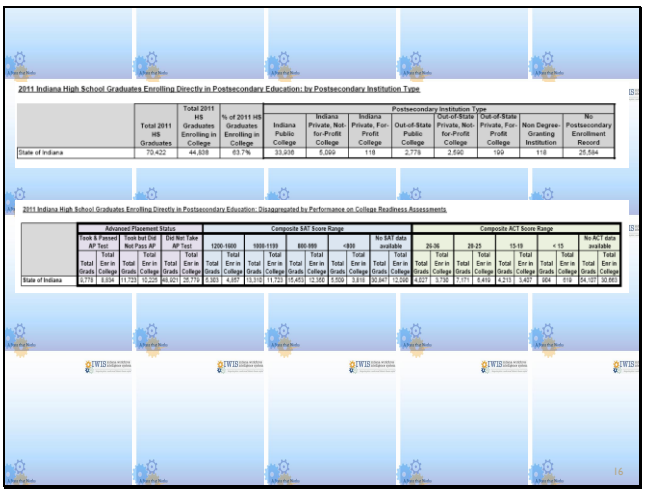
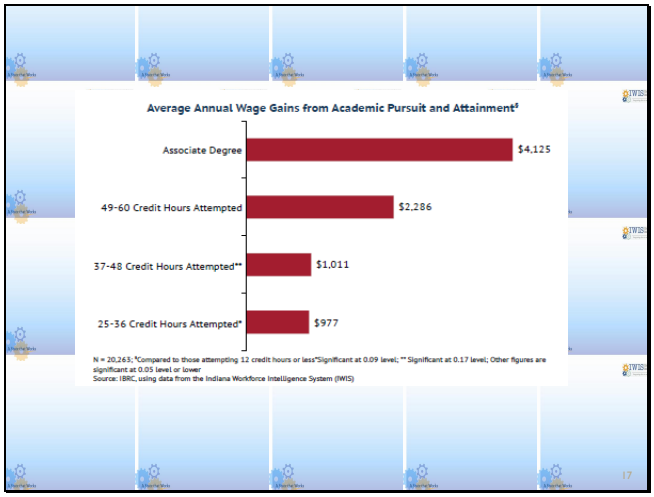


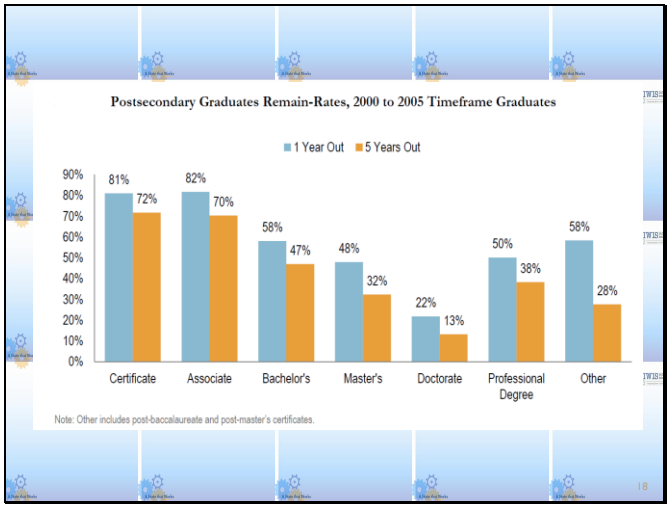
2011 Indiana High School Graduates Enrolling Directly in Postsecondary Education: by Postsecondary Institution Type

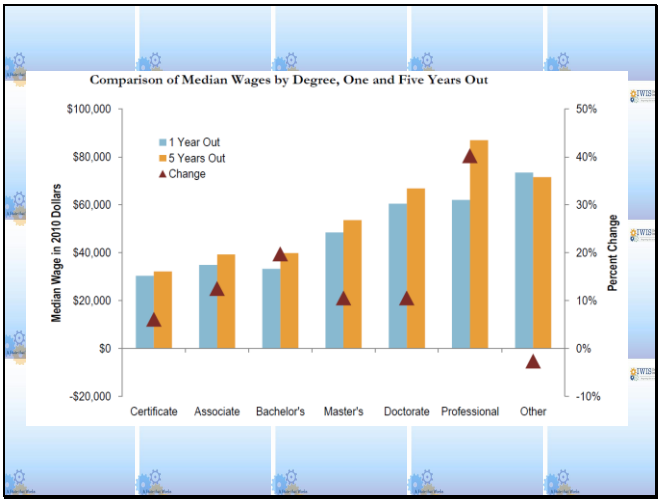
	Total 2011 HS Graduates	Total 2011 HS Graduates Enrolling in College	% of 2011 HS Graduates Enrolling in College	Postsecondary Institution Type							
				Indiana Public College	Indiana Private, Not-for-Profit College	Indiana Private, For-Profit College	Out-of-State Public College	Out-of-State Private, Not-for-Profit College	Out-of-State Private, For-Profit College	Non Degree-Granting Institution	No Postsecondary Enrollment Record
State of Indiana	79,422	44,838	63.7%	33,938	5,099	118	2,778	2,590	199	118	25,584

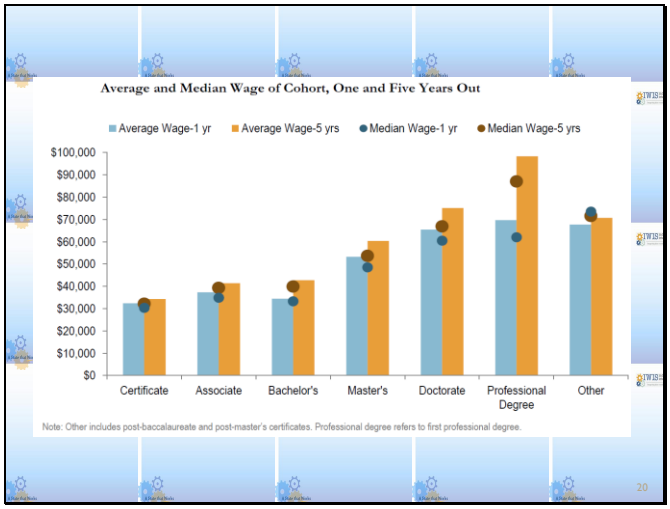
2011 Indiana High School Graduates Enrolling Directly in Postsecondary Education: Disaggregated by Performance on College Readiness Assessments

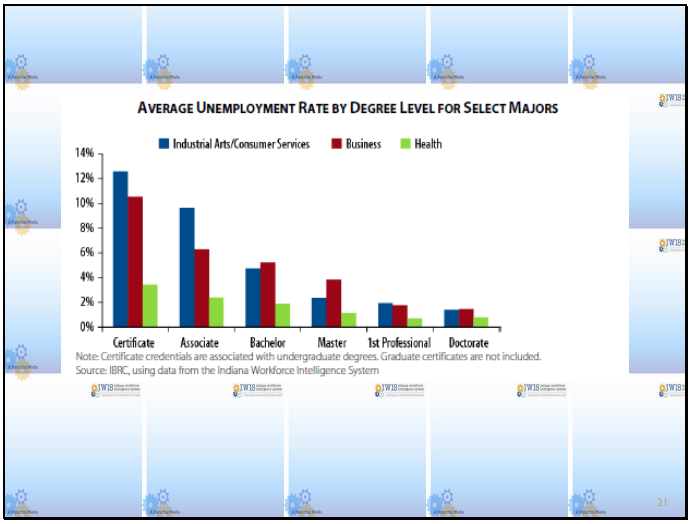
	Advanced Placement Status						Composite SAT Score Range										Composite ACT Score Range									
	Took & Passed AP Test		Took but Did Not Pass AP		Did Not Take AP Test		1200-1600		1000-1199		800-999		<800		No SAT data available		20-36		20-25		15-19		< 15		No ACT data available	
	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College	Total Grads	Total Enr in College
State of Indiana	6,773	6,634	11,723	10,226	60,921	25,778	5,383	4,897	13,310	11,723	15,453	12,366	5,509	3,918	30,947	12,046	4,627	3,736	7,171	6,459	4,213	3,437	964	819	54,187	30,863



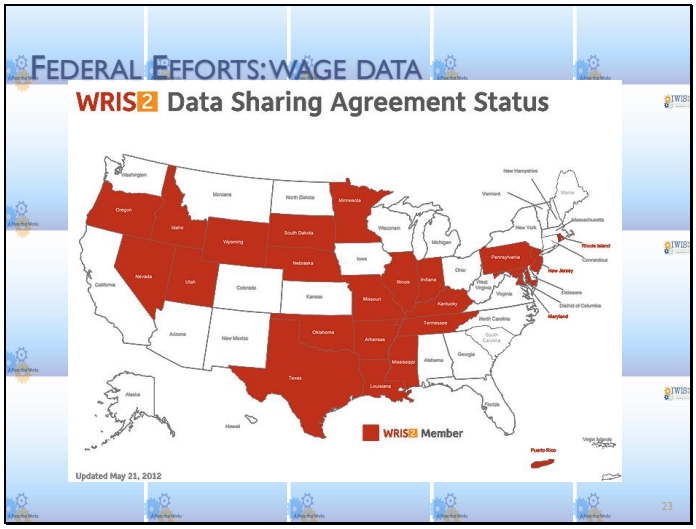


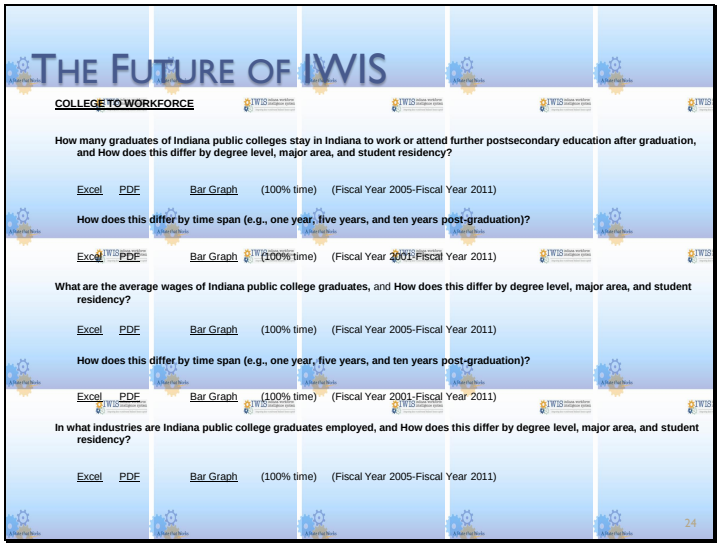

Comparison of Median Wages by Degree, One and Five Years Out
$100,000
$80,000
$60,000
$40,000
$20,000
$0
-$20,000
50%
40%
30%
20%
10%
0%
-10%
1 Year Out
5 Years Out
Change
Median Wage in 2010 Dollars
Percent Change
Certificate
Associate
Bachelor's
Master's
Doctorate
Professional
Other

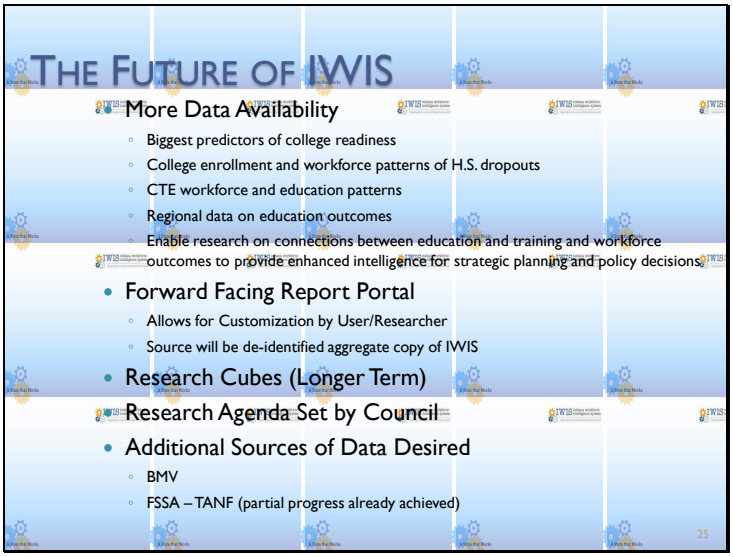

Average and Median Wage of Cohort, One and Five Years Out
Average Wage-1 yr
Average Wage-5 yrs
Median Wage-1 yr
Median Wage-5 yrs
$100,000
$90,000
$80,000
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
Certificate
Associate
Bachelor's
Master's
Doctorate
Professional Degree
Other
Note: Other includes post-baccalaureate and post-master's certificates. Professional degree refers to first professional degree.
20


AVERAGE UNEMPLOYMENT RATE BY DEGREE LEVEL FOR SELECT MAJORS
Industrial Arts/Consumer Services
Business
Health
14%
12%
10%
8%
6%
4%
2%
0%
Certificate
Associate
Bachelor
Master
1st Professional
Doctorate
Note: Certificate credentials are associated with undergraduate degrees. Graduate certificates are not included.
Source: IBRC, using data from the Indiana Workforce Intelligence System
21

Industries Employing Indiana Graduates 1 Year after Graduation by Sector
These data, drawn from the How Education Pays report, reflect students who graduated from Indiana's public colleges and universities between 2000 and 2005 and were employed in the state from 2001 to 2010 (i.e., those who were employed both one year and five years after graduation). Indiana had 95,237 individuals who met the specifications, representing 43.1 percent of all public college and university graduates within the 2000 to 2005 timeframe.
Click on an industry sector to see the total number of Indiana graduates that entered each industry sub-sector along with their median wage one year after graduation.
* Indicates that the data were non-disclosed (less than 10 graduates in the cohort).
Agriculture, Forestry, Fishing and Hunting
Construction
Education
Financial Activities
Government
Health Services
Ambulatory Health Care Services (NAICS 621)
Graduates Median Wage
Certificate 1,140 25,856
Associate 1,889 35,123
Bachelor's 1,751 30,197
Master's 672 47,078
Hospitals (NAICS 622)
Graduates Median Wage
Certificate 1,188 29,741
Associate 4,942 43,036
Bachelor's 4,021 44,122
Master's 945 47,786
22


FEDERAL EFFORTS: WAGE DATA
WRIS2 Data Sharing Agreement Status
WRIS2 Member
Updated May 21, 2012
23


THE FUTURE OF IWIS
COLLEGE TO WORKFORCE
How many graduates of Indiana public colleges stay in Indiana to work or attend further postsecondary education after graduation, and How does this differ by degree level, major area, and student residency?
Excel PDF Bar Graph (100% time) (Fiscal Year 2005-Fiscal Year 2011)
How does this differ by time span (e.g., one year, five years, and ten years post-graduation)?
Excel PDF Bar Graph (100% time) (Fiscal Year 2001-Fiscal Year 2011)
What are the average wages of Indiana public college graduates, and How does this differ by degree level, major area, and student residency?
Excel PDF Bar Graph (100% time) (Fiscal Year 2005-Fiscal Year 2011)
How does this differ by time span (e.g., one year, five years, and ten years post-graduation)?
Excel PDF Bar Graph (100% time) (Fiscal Year 2001-Fiscal Year 2011)
In what industries are Indiana public college graduates employed, and How does this differ by degree level, major area, and student residency?
Excel PDF Bar Graph (100% time) (Fiscal Year 2005-Fiscal Year 2011)
24


THE FUTURE OF IWIS
More Data Availability
Biggest predictors of college readiness
College enrollment and workforce patterns of H.S. dropouts
CTE workforce and education patterns
Regional data on education outcomes
Enable research on connections between education and training and workforce outcomes to provide enhanced intelligence for strategic planning and policy decisions
Forward Facing Report Portal
Allows for Customization by User/Researcher
Source will be de-identified aggregate copy of IWIS
Research Cubes (Longer Term)
Research Agenda Set by Council
Additional Sources of Data Desired
BMV
FSSA – TANF (partial progress already achieved)
25

Attachment 2 – The Path Forward for IWIS – Deloitte Consulting Group

Deloitte.

Indiana Career Council IWIS Taskforce

The Path Forward for IWIS

October 15, 2013

Official Professional Services Sponsor

Professional Services means audit, tax, consulting and financial advisory services.

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Our Understanding	4
Key Challenges	9
Proposed Path Forward	12
Deloitte Capabilities	15
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Introductions

Todd Higgins, Principal

Todd is a Principal in Deloitte's Public Sector practice with 26 years of professional consulting experience, the last 15 with Deloitte. Todd serves as Deloitte's Lead Client Service Partner for the State of Indiana. Throughout his 26 years, Todd has focused on transformational projects with a focus on IT transformations, most of which have been in the public sector. He has extensive experience in the management, planning, design, and implementation of custom and package systems and has served in a number of technical and management roles as his career has progressed. Todd has served a number of Indiana State agencies including DCS, DOR, FSSA, ISP, OMB and OIT and currently is serving in a Client Executive role for Deloitte's work with FSSA to enhance and replace technology solutions to meet the Affordable Care Act.

Philip Benowitz, Director

Phil is a Director in Deloitte's Public Sector Consulting Practice and is a leader of the State Education Consulting Practice. He has over 26 years of experience providing performance improvement and information technology consulting services to state and local education agencies in over 15 states. His state government experience includes leading the implementation of statewide longitudinal data systems in Pennsylvania, North Carolina, Nebraska, and New Mexico and serving as an advisor for SLDS implementations in Georgia and Colorado. Phil's experience with over two dozen local education agencies includes ERP system implementations and operations and organization improvement studies. In addition, he served as an advisor on the development and implementation of the Migrant Student Information Exchange (MSIX) for the US Department of Education

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Introductions (continued)

Alan Hartwig, Specialist Leader

Alan Hartwig is a Specialist Leader with Deloitte Consulting. He has over 25 years of experience in public sector information technology with a primary focus in state and local government including education. His experience includes project management, business intelligence, strategic planning and systems development. His statewide longitudinal data system clients include Pennsylvania, South Dakota, North Carolina, New Mexico and Nebraska.

Loren Osgood, Senior Manager

Loren Osgood is a Senior Manager at Deloitte Consulting with 15 years of experience. He provides strategy development and implementation, program integrity, process improvement, change management, and business transformation services for higher education, public sector and private sector organizations. He has led engagements to develop overarching enterprise-wide strategic plans, including developing the roadmap for the implementation of strategic plans including key performance indicators. Through his work with Higher Education institutions, large federal agencies and state and local agencies, he's developed a strategic plans with senior level executives to address issues in financial management, human capital management, IT systems, business processes, customer service, and administration transition.

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Our Understanding of the ICC mission

The goals of the Indiana Career Council (ICC) are to:

- Improve the effects of the state's educational delivery system on the economic opportunities of individuals and the state's workforce and to guide state and local decision makers
- Align education and training resources at various levels (K-12, Ivy Tech, Higher Ed) with the anticipated future needs of Indiana employers

Achieving these goals requires significant buy-in from multiple stakeholders and a fresh examination of existing processes

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Our Understanding of the IWIS Taskforce

The IWIS Taskforce has been charged with creating a plan for the future of IWIS that supports the goals and objectives of the ICC.

Goal: Improve Economic Opportunities

- Ensure that the state's educational system provides individuals with the skills necessary to improve their economic situation
- Provide the ability to report on the jobs obtained by individuals completing specific educational programs targeted to specific job needs
- Provide the ability to track wages for individuals completing these programs to identify the economic impact at the individual level
- Conduct regular surveys and assessments of employer skill needs

Goal: Align Resources

- Ensure that educational curriculums align with anticipated jobs and required skills
- Provide the ability to map educational programs to specific skills
- Provide the ability to map future jobs to specific skills

IWIS Taskforce

- Create a plan to enhance IWIS to meet the goals
- Identify required financial and human resources to implement the plan
- Identify required technical resources
- Identify data and data sources required to meet the goals

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Our Understanding of IWIS Today and in the Future

The Indiana Workforce Information System is a data warehouse and reporting system supported by multiple stakeholders.

- Organized and governed by a consortium comprised of:
  - Indiana Commission for Higher Education
  - Indiana Department of Education
  - Indiana Department of Workforce Development
  - Indiana Business Research Center
- Integrates data from these agencies' source systems
- Contains hundreds of millions of wage, unemployment insurance claims, new hire, student, and other related records
- Designed around major "events" – employment, enrollment in college, graduation date, unemployment dates, new hire dates, etc.

The State's vision is for IWIS to become an even more dynamic system that facilitates the alignment of educational curriculum with anticipated jobs and required skills

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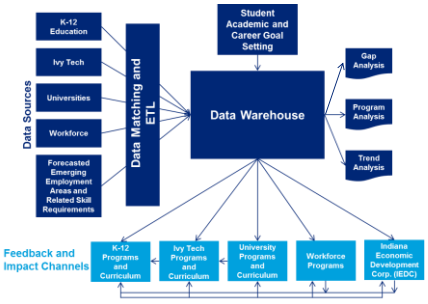
Notional IWIS Architecture and Data Flow*

Alignment of education/training resources with expected employment opportunities requires integration of systems and processes.



Highlights

- IWIS data warehouse integrates education and workforce data and projected employment and skill needs in a single data warehouse
- Business intelligence tools to address key business questions and issues including identification of gaps between expected employer skill needs and existing education and training programs and curriculum
- Student academic and career goal setting tool that leverages data in the data warehouse to align student planning with expected employment opportunities
- Channels that provide feedback on required changes to education programs and curriculum

* Diagram presents a prospective high level architecture for IWIS and is not intended to be prescriptive; it is just one example of the type of systems and process alignment and integration that is required to achieve ICC's vision for IWIS.

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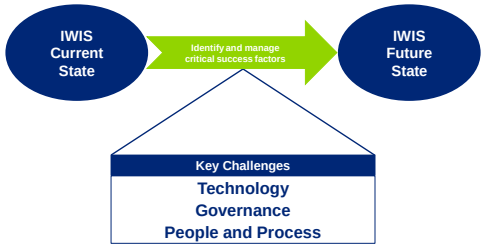
Moving Towards the Future State

The future vision for IWIS is ambitious and progressive, yet attainable. The path to enhancement requires identifying challenges and developing a strategy that addresses critical success factors, leveraging the significant work completed to date.



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Challenges Moving Forward – Technology

- Developing and maintaining a technology architecture that is scalable to support data growth and new subject areas
  - Hardware
  - ETL
  - Data Model
  - Analytical Tools
  - Public-Facing Portal
  - Network
- Developing a solution to protect and secure confidential data and sensitive information

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Challenges Moving Forward – Governance

- Establishing program governance structure to facilitate decision-making, gain consensus on overall direction, and provide oversight
- Facilitating collaboration and coordination across multiple stakeholders and organizations
- Developing data governance that supports the definition, security, availability, usability, and quality of data

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Challenges Moving Forward – People and Process

- Socializing the value proposition for IWIS
- Identifying the critical policy questions to be addressed by IWIS
- Obtaining and maintaining executive buy-in and alignment
- Identifying a consistent stream of funding
- Developing and institutionalizing processes that support program success
- Changing curriculum across educational levels/components
- Attracting and involving business community, leveraging the system to drive economic development
- Integration of job forecast data (by industry) and student graduation trends/projections (by academic program) – i.e. CIP-SOC crosswalk

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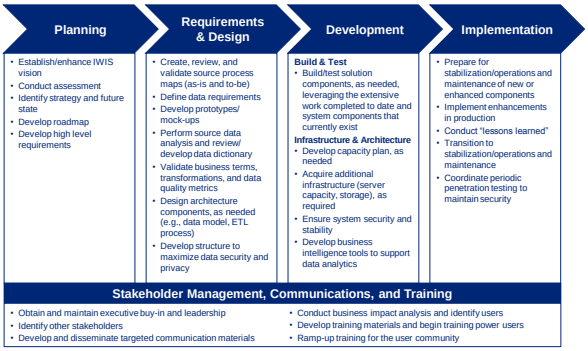
Proposed Path Forward – From Planning to Go-Live

There are four key phases to enhancing IWIS, supported by continuous communication and collaboration with key project stakeholders.



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Proposed Path Forward – Planning Phase

A successful enhancement project that takes IWIS to the next level of data intelligence requires a thorough initial planning study. Key elements include:

	Purpose	Sample Activities
Vision	• Defines the value proposition and why it is necessary to enhance IWIS' current capabilities • Identifies the values and strategic goals being pursued • Provides an overview of what the IWIS enhancements will make possible	• Half-day workshop with IWIS Taskforce members, ICC representatives, and other key stakeholders to enhance existing IWIS vision and align it with project goals • Validation session with broader audience to socialize the vision and solicit feedback
Assessment	• Outlines the current state of IWIS systems, reporting, and analysis • Identifies the key business drivers for change towards the future vision • Provides high-level information requirements for IWIS updates and enhancements	• One-on-one interviews with key stakeholders • Review of current system landscape, existing architecture, and reporting structures • Compile IWIS successes to date and current challenges • Half-day workshop to discuss assessment results
Strategy & Future State	• Defines the necessary components to deliver the IWIS data warehouse/business intelligence vision • Defines the future state of IWIS with respect to governance, change management, technical and data architecture, and information lifecycle	• Conduct gap analysis between current state and desired future state • Establish and socialize governance structure for the IWIS enhancement project
Roadmap	• Establishes a plan of action and set of milestones along a phased path that implements new capabilities in realistic increments • Identifies critical success factors for key steps • Outlines funding sources for continued development and maintenance • Gather high-level requirements	• Prioritization workshop with key stakeholders and Deloitte SME's to establish sequencing of sub-projects/tasks • One-on-one interviews to assess critical success factors and barriers to implementation

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What should the ICC seek from a Vendor Partner?

We believe that the partner that the ICC hires to help drive and facilitate its IWIS planning should possess several critical capabilities and experiences:

- Deep domain knowledge:
  - Government Education and Workforce programs and data
  - Corporate Workforce planning
  - Economic Competitiveness
- Extensive analytics capabilities and experience:
  - Data Warehouse and Business Intelligence
  - Predictive Analytics
- Successful large scale systems implementation experience with state governments Including Indiana
- Data privacy and protection expertise, given the nature of the data collected and analyzed in the IWIS warehouse

Deloitte's experience and core capabilities directly align with the skills and background ICC requires in a partner

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Deloitte Capabilities – Key Relevant Areas

State Gov't Information Systems	• Deloitte is one of the leading providers of information systems development services to state governments including the State of Indiana. Our experience includes all facets of the Systems Development Life Cycle (SDLC) and includes experience with both COTS and custom solutions • We have developed and implemented large scale information systems for most of the 50 states and across all major state government cabinet agencies
Privacy & Data Protection	• **Deloitte's Data Protection** service offering with over 1500 dedicated security and privacy experienced professionals that help organizations identify and manage security and privacy risks associated with information management • We can assist clients with the personal and confidential information through the life cycle from collection, processing, storing, data sharing and destruction processes with the relevant state, federal and industry associated protection requirements – implementing solutions based on their specific requirements, environment, and current level of protection maturity
Analytics	• The **Deloitte Analytics Practice** includes over 1,500 dedicated and experienced professionals • Services include business intelligence/data warehousing, predictive analytics, enterprise data management, and data visualization

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Deloitte Capabilities – Key Relevant Areas

Education	• The **Deloitte Education Consulting Practice** serves organizations involved in every stage of the education lifecycle – early childhood, primary, secondary, and postsecondary • Our experience includes statewide data systems (including workforce data), ERP implementations, organizational change management, business and organizational redesign, and employment market studies
Workforce	• **Deloitte's Workforce** related consulting services include analytics and large scale systems development and implementation • Our **Workforce Analytics Services** help organizations improve people management decisions and control workforce costs. Our services and solutions are designed to help organizations link their business strategy to advanced analytical techniques to improve their overall performance
Economic Competitiveness	• Deloitte has extensive experience helping national, state/provincial, and local governments in the US and around the world address challenges associated with their economic competitiveness • We help these clients identify barriers, problems, and new opportunities for economic growth and develop a strategy to overcome the barriers and problems and seize the opportunities

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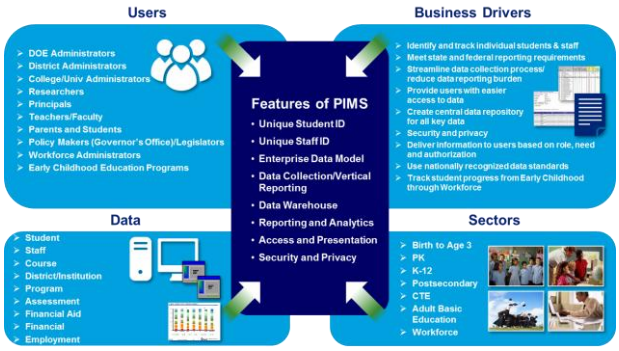
Deloitte Case Study – PIMS



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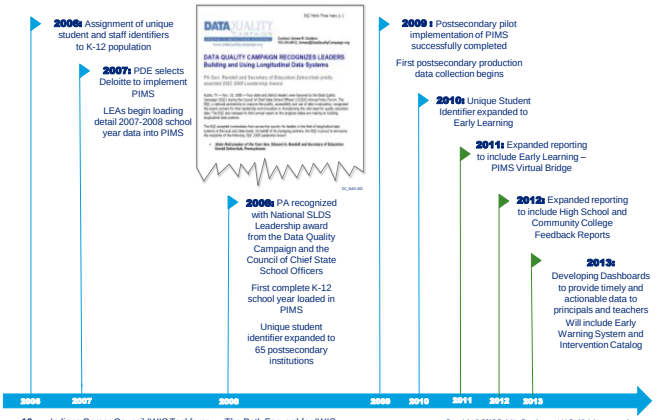
Deloitte Case Study – PIMS Timeline



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Deloitte Case Study – PIMS Overview

- PIMS is Pennsylvania's statewide longitudinal data system (SLDS)
- Designed to improve student college and career readiness through more efficient and effective use of data
- Same unique student ID assigned in early learning program follows student through elementary, secondary, and postsecondary education
- Implemented in over 800 Local Education Agencies and 30 Institutions of Higher Education
- Features enterprise-wide data collection, data warehouse and reporting system
- Includes approximately 700 data elements across a broad range of data domains
- Includes over 1,000 reports and cubes developed with Cognos Business Intelligence Suite including:
- High School Feedback Reports
- PIMS–Early Learning Virtual Reporting Bridge for reporting and analysis from early learning through postsecondary
- Currently evaluating options for integrating Workforce data

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Questions?

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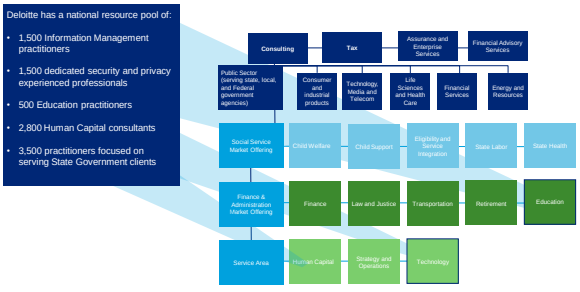
Appendix

Deloitte's Capabilities

Deloitte Capabilities – Breadth and Depth

The following organizational chart for Deloitte highlights our Education, Technology, Public Sector, and Human Capital consulting practices, each of which offer capabilities that are directly relevant to the ICC vision for IWIS.



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Deloitte Capabilities – State Government Information Systems

Deloitte is one of the leading providers of information systems development services to state governments including the State of Indiana. Our experience includes all facets of the Systems Development Life Cycle (SDLC) and includes experience with both COTS and custom solutions.

Deloitte has 3,500 employees focused on serving state government clients. We have developed and implemented large scale information systems for most of the 50 states and across all major state government cabinet agencies including:

- Health and Human Services
- Finance, Treasury, and Administration
- Labor and Industry
- Education
- Criminal Justice
- Transportation and Motor Vehicles

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Deloitte Capabilities – State Government Information Systems

Our systems implementation experience, which also includes Change Management, Training and Business Process Reengineering, gives us a unique perspective on system planning efforts. We understand what is required for a successful systems development initiative and bring that practical mindset to planning projects.

Two examples of our state government system development experience include:

- Integrated Eligibility Determination Services System (IEDSS) - ongoing project to assist the Indiana FSSA with the design, development and implementation of an integrated eligibility system. This highly advanced system will by utilized 3,000+ eligibility workers and over 1 million clients that FSSA supports. This system will replace the legacy Indiana Client Eligibility System (ICES) in which Deloitte assisted the Indiana implement over 20 years ago.
- Indiana Verification and Enforcement of Support System (INvest) – ongoing project to assist the Indiana DCS with the requirements identification and development for this new advanced statewide system to support the enforcement and collection of child support payments.

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Deloitte Capabilities – Privacy and Data Protection

Deloitte has over 1,500 dedicated professionals that focus on security and privacy and data protection solutions. This practice is recognized by Forrester and Kennedy as the leader in risk management services.

Our State Security and Data Protection serves over 20 states currently. Two examples of our state government system development experience include:

- Integrated Eligibility Determination Services System (IEDSS) – our security team is working incorporated security, privacy and data protection processes and systems that address CMS, HIPAA, IRS, and state and federal regulations into the solution. We are implementing security logging and event solution, providing design and build expertise for incorporating data protection measures in the solution, performing vulnerability assessments, and providing security compliance assessments for the solution throughout the project.
- We have supported development of security and data protection and privacy policy, governance, security assessments and strategy for states with data breach and incident response in South Carolina and Utah.

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Deloitte Capabilities – Analytics

The Deloitte Analytics Practice includes over 1,500 professionals and provides the following services:

- Business intelligence/data warehousing
- Predictive analytics
- Enterprise data management
- Data visualization

Did you know…

Deloitte has been recognized as a Leader in Gartner's Magic Quadrant for Business Intelligence Implementation Services in North America

As previously described, we have provided analytics services to a number of education agencies and have proprietary workforce analytics solutions that serve public and private sector clients.

In order to support our analytics work with clients, Deloitte developed the Highly Immersive Visual Environment (HIVE) facility in Washington, DC which assists clients in identifying analytics capabilities specializing in visualization techniques and rapid application development.

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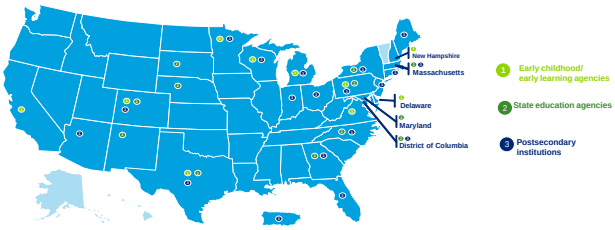
Deloitte Capabilities – Education

The Deloitte Education Consulting Practice serves organizations involved in every stage of the education lifecycle – early childhood, primary, secondary, and postsecondary.



Our experience includes statewide data systems (including workforce data), ERP implementations, organizational change management, business and organizational redesign, and employment market studies.

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Deloitte Capabilities – Education

As an example of our services to education agencies, Deloitte was engaged by the Georgia Governor's Office of Student Achievement to develop a data warehouse and reporting solution that integrates data from state source systems including:

- Early childhood
- K-12
- Higher education
- Workforce
- National Student Clearinghouse

GA AWARDS includes a master data management solution that integrates the data from the source systems as well as two business intelligence tool suites.

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Deloitte Capabilities – Education Market Analysis

We have conducted employment market analysis studies for a number of colleges and universities including Indiana University Online. The scope of these studies typically includes:

- Identification of regional high growth employment areas
- Assessment of current institutional market share for degrees that naturally feed "high" demand occupations
- Market forecast by program and occupation
- Alignment of program offerings to the needs of regional job creators
- Recommendations to refocus resources to improve competiveness and profitability

Market Segment Analysis Highlights Regions Underserved by Higher Education

Market	Overall Market Opportunity	Market Space	10-Year Employment Growth Forecast	STEM Alignment Bachelor's	High-Growth, High-Wage Alignment Bachelor's	Key Competitor
Region 1		Hyper Competitive	0.4%	Norm	Norm	UoX, XXU, & UoZ
Region 2		Hyper Competitive	0.6%	Norm	Norm	UoM, XXU, XYZU, YXU, & WXU
Region 3		Hyper Competitive	0.4%	Norm	Norm	XXU & UoX
Region 4		Hyper Competitive	-0.1%	Norm	Norm	WXU, UoX, & XXU
Region 5		Highly Competitive	0.1%	Norm	Norm	UoX & UoY
Region 6		Limited Market Space	0.7%	Norm	Norm	UoZ & XXU
Region 7		Limited Market Space	0.7%	Norm	Norm	XYZU & YXU
Region 8		Limited Market Space	1.2%	Norm	Norm	WXU & XYZU
Region 9		Market Space Exists	1.6%	Norm	Norm	XXU, UoX, & XYUU

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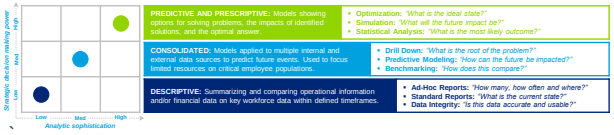
Deloitte Capabilities – Workforce

Deloitte's Workforce related consulting services include analytics and large scale systems development and implementation.

Our Workforce Analytics Services help organizations improve people management decisions and control workforce costs. Our services and solutions are designed to help organizations link their business strategy to advanced analytical techniques to improve their overall performance. Our solutions include:

- Workforce supply/demand planning
- Predictive employee retention/engagement
- Workforce risk management – risk planning, simulations, schedule optimization

Our Approach | Deloitte helps organizations climb the workforce analytics maturity curve



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Deloitte Capabilities – Workforce

An example of our Workforce Analytics services is a study we conducted for the Commonwealth of Kentucky. The study assessed access to and availability of Kentucky's health care workforce, identified shortage areas where an increase in the health care workforce was necessary to meet the needs of Kentuckians, identified and assessed legislative and administrative policy changes needed to increase the supply of health care providers, and developed recommendations and strategies, for recruiting and maintaining an adequate health care workforce.

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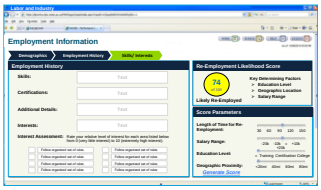
Deloitte Capabilities – Workforce

An example of our workforce systems development experience is the Comprehensive Workforce Development System (CWDS) we developed for the Pennsylvania Department of Labor and Industry. This project included requirements development, design, systems development, implementation, change management and training services. CWDS is one of the most comprehensive workforce systems in the country and includes:

- Job Seeker Services
- Vocational Rehabilitation
- Employer Services
- Provider Management
- New Hire Reporting



In addition to being comprehensive, CWDS is also an advanced workforce solution. For example, CWDS employs predictive analytics and multiple sources of information (i.e. spidering) to help job seekers find the right job.

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Deloitte Capabilities – Economic Competitiveness

Deloitte has extensive experience helping national, state/provincial, and local governments in the US and around the world address challenges associated with their economic competitiveness. We help these clients identify barriers, problems, and new opportunities for economic growth and develop a strategy to overcome the barriers and problems and seize the opportunities. The issue of workforce and skills is a common challenge identified in these studies, especially the challenge of aligning local/regional industrial needs with the education system.

We help to accelerate the economic growth of our clients by offering a full suite of analytic and implementation services across a wide range of industries.

In addition, through the Deloitte Chief Economist we team with economic forecasting firms to produce economic forecasts for internal and client purposes.

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Attachment 3 – Data Quality Campaign Presentation to IWIS Taskforce

DQC DATA QUALITY CAMPAIGN — Using Data to Improve Student Achievement

Indiana Career Council
Indiana Workforce Intelligence System Taskforce

Paige Kowalski, Director, State Policy and Advocacy

October 15, 2013

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How Data Can Help Us Make Better Decisions

- ***In the education sector, leaders…***
  - Make decisions by hunch or anecdote
  - Throw darts hoping to hit the bullseye

- ***In all other sectors, leaders…***
  - Make decisions based on data
  - Have dashboards at their fingertips

- ***To get from "here" to "there," leaders…***
  - Must lead a culture change
  - Support data use for continuous improvement

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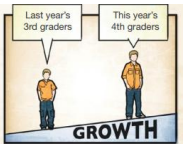
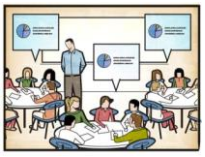
Effective Data Use Means Continuous Improvement





PAST: COMPLIANCE

PRESENT: ACCOUNTABILITY

FUTURE: CONTINUOUS IMPROVEMENT

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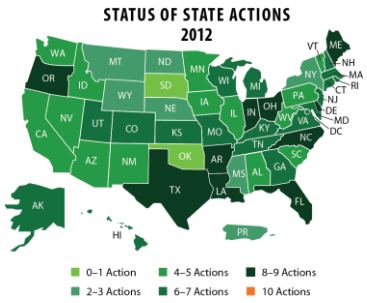
Changing Culture is *Harder* than Building Systems

No state has all 10 Actions



10 State Actions

1. Link P-20/W Data Systems (14 states)
2. Create stable, sustained support (35)
3. Develop governance structures (40)
4. Build data repositories (45)
5. Provide timely data access (5)
6. Create individual student progress reports (36)
7. Create longitudinal reports (42)
8. Develop research agenda (38)
9. Build educator capacity (6)
10. Raise awareness of available data (26)

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Start With Your Questions!

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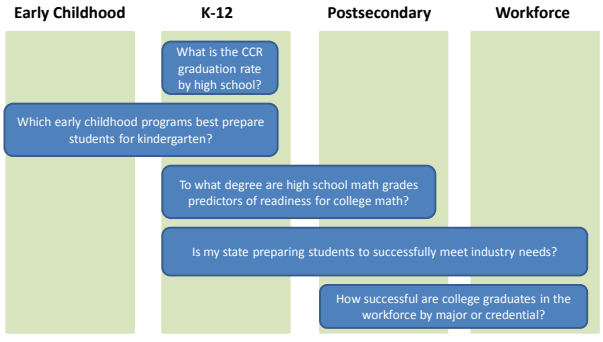
DATA QUALITY CAMPAIGN

The Importance of P20/Workforce Longitudinal Data



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Maryland's P20/W System Answers 15 Policy Questions

Critical Education Policy Questions:

1. Are Maryland students academically prepared to enter postsecondary institutions and complete their programs in a timely manner?
2. What percentage of Maryland high school exiters go on to enroll in Maryland postsecondary education?
3. What percentage of Maryland high school exiters entering college are assessed to need to take developmental courses and in what content areas?
4. How likely are students placed in developmental courses to persist in postsecondary education and transfer and/or graduate?
5. Are community college students able to transfer within state to 4-year institutions successfully and without loss of credit?

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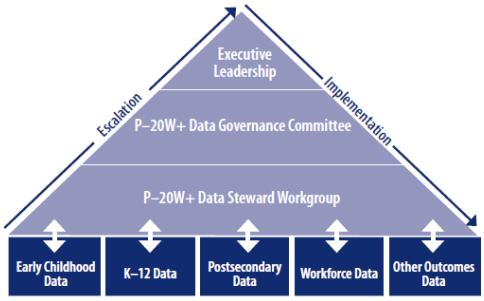
P20W Data Governance



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P20W Data Governance: Recommendations for States

- Establish the right structure
- Select the right people
- Empower the structure with the authority to make necessary decisions and implement charges
- Ensure that the structure is sustainable, protecting the continuity of the state's vision

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State Legislation Driving Public Reporting

- SB275 created MD's P20/w data governing board
- SB83 created the Kentucky Center for Education and Workforce Statistics
- HB605 directs IL to develop CCR report cards
- Legislation established WA's Education Research & Data Center

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Balancing Access to Information with the Need to Ensure Student Privacy

- Provide clear information on what data is collected, for what purpose, and who has access
- Post user-friendly privacy policies on state websites
- Establish agency and P-20 data governance structures to delineate roles and responsibilities
- Ensure that data collection and use is led by policymakers instead of IT and mid-level agency staff

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Your Role in Getting There

- Develop your state's policy questions
- Ensure your state's P20/W data system is aligned to your state's policy objectives
- Ensure P20/W data governance and privacy policies are established and implemented
- Ensure stakeholders have actionable information and the skills to use it effectively and ethically
- *Communicate, communicate, communicate!*

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Resources

- DQC's policy primer on P20/W data governance
- DQC's policy primer on ensuring student data privacy
- Indiana's 2012 DQC state profile
- Maryland's "MLDS Center" website
- Kentucky's "Center for Education and Workforce Statistics" website
- Washington's "Education Data & Research Center" website

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